DOCUMENT RESUME

ED 415 607 EC 306 074

TITLE	Interventions for Students with Learning Disabilities.
INSTITUTION	National Information Center for Children and Youth with Disabilities, Washington, DC.
SPONS AGENCY	Special Education Programs (ED/OSERS), Washington, DC.
PUB DATE	1997-07-00
NOTE	17p.; For related bibliography, see EC 306 092.
CONTRACT	H030A30003
AVAILABLE FROM	NICHCY, P.O. Box 1492, Washington, DC 20013; toll-free telephone: 800-695-0285; telephone: 202-884-8200; e-mail: nichcy@aed.org
PUB TYPE	Collected Works - Serials (022) -- Guides - Non-Classroom (055)
JOURNAL CIT	NICHCY News Digest; v25 Jul 1997;
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Beginning Reading; Decoding (Reading); Elementary Education; *Intervention; *Learning Disabilities; *Learning Strategies; Metacognition; Phoneme Grapheme Correspondence; Phonics; Phonology; *Reading Instruction; Teaching Methods
IDENTIFIERS	*Phonological Awareness

ABSTRACT

This news digest issue, which accompanies a bibliography titled "Learning Strategies for Students with Learning Disabilities", focuses on two promising interventions for students with learning disabilities: helping students develop their use of learning strategies and helping them develop their phonological awareness. In the first article, titled "Teaching Students with Learning Disabilities To Use Learning Strategies," Neil Sturomski briefly discusses the learning difficulties of students with learning disabilities, defines "learning strategies," gives examples from the reading field, and reviews research on the use of learning strategies. He then details a six-step process for teaching learning strategies: (1) pretest and motivate students, (2) describe the strategy, (3) model the strategy, (4) practice the strategy, (5) provide feedback, and (6) promote generalization. The second article is "Phonological Awareness" by William Ellis. It discusses the important role that phonological awareness plays in reading ability and notes that 15 to 20 percent of children do not learn to read successfully unless they receive direct instruction in phonological awareness. This article also offers suggestions for activities to enhance phonemic awareness in students and urges better training of teachers in phonemic awareness. (The two articles contain 26 and 25 references, respectively.) (DB)

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ED 415 607

Volume 25—July 1997

NEWS DIGEST

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Interventions for Students with Learning Disabilities

Students with learning disabilities often find learning a difficult and painful process. The presence of their learning disability can make learning to read, write, and do math especially challenging.

This *News Digest* focuses upon two promising interventions for students with learning disabilities: helping students develop their use of learning strategies and helping them develop their phonological awareness. In the first article, Neil Sturomski discusses the importance of teaching students *how* to learn—specifically, how to use learning strategies to become more purposeful, effective, and independent learners. Research on the use of learning strategies is described briefly, and a process for teaching students about learning strategies is described in detail. This process will be useful for teaching virtually any strategy or set of strategies to students.

A wide variety of learning strategy interventions have been developed over the past 15 years. To identify what strategies might be most appropriate for specific students, teachers can use NICHCY's separate bibliography *Learning Strategies for Students with Learning Disabilities*. This bibliography provides a listing of articles and books on strategies useful in reading, math, science, and other academic areas.

The second article in this *News Digest* was written by William Ellis for NICHCY in 1996 and focuses upon the important role that phonological awareness plays in our ability to learn to read. Phonological awareness refers to understanding that the letters of the alphabet correspond to certain sounds and, combined in certain patterns, form meaningful words. Because students with learning disabilities often have great difficulty learning to read, activities addressing and developing their phonological awareness can be the key they need to break the "alphabetic code" and become skilled readers.

Together, these two articles provide information to help professionals working with students with learning disabilities address the special needs of these special students.

Table of Contents

Teaching Students with LD to Use Learning Strategies 2
References 12
Phonological Awareness 13
References & Resources 15

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Teaching Students With Learning Disabilities To Use Learning Strategies

by

Neil Sturomski

Learning is the process of acquiring—and retaining— knowledge so it may be applied in life situations. Learning is not a passive process. As any teacher can attest, students are not vessels into which new information is poured and then forever remembered. Rather, learning new information and being able to recall and apply it appropriately involves a complex interaction between the learner and the material being learned. Learning is fostered when the learner has opportunities to practice the new information, receive feedback from an "expert," such as a teacher, and apply the knowledge or skill in familiar and unfamiliar situations, with less and less assistance from others.

To each new learning task, students bring their own ideas, beliefs, opinions, attitudes, motivation, skills, and prior knowledge; they also bring with them the strategies and techniques they have learned in order to make their learning more efficient. All these aspects will contribute directly to the students' ability to learn, and to remember and use what has been learned.

The focus of this article is on helping students become more efficient and effective learners by teaching them *how* to learn. By equipping them with a repertoire of strategies for learning—ways to organize themselves and new material; techniques to use while reading, writing, and doing math or other subjects; and systematic steps to follow when working through a learning task or reflecting upon their own learning—teachers can provide students with the tools for a lifetime of successful learning.

The Learning Difficulties of Students with Learning Disabilities

It is no secret that many students find learning a difficult and painful process. Learning may be made more difficult by any number of factors, including inadequate prior knowledge, poor study skills, problems with maintaining attention, cultural or language differences, and—as is the focus of this *News Digest*—the presence of a learning disability. Students who have learning disabilities are often overwhelmed, disorganized, and frustrated in learning situations. Learning can become a nightmare when there are memory problems, difficulties in following directions, trouble with the visual or auditory perception of information, and an inability to perform paper-and-pencil tasks (i.e., writing compositions, notetaking, doing written homework, taking tests).

Another aspect of learning that presents difficulties for students who have learning disabilities is why they think they succeed or fail at learning. Due to their history of academic problems, such students may believe that they cannot learn, that school tasks are just too difficult and not worth the effort, or that, if they succeed at a task, they must have gotten lucky. They may not readily believe that there is a connection between what they do, the effort they make, and the likelihood of academic success. These negative beliefs about their ability to learn, and the nature of learning itself, can have far-reaching academic consequences.

While a detailed description of how learning disabilities affect the learning process is beyond the scope of this document, much information is available on the subject. NICHCY makes available a publication called *Reading and Learning Disabilities: A Resource Guide*, which presents an overview of learning disabilities and a listing of helpful books and organizations that can provide indepth information and guidance on this disabilit. An annotated bibliography called *Educating Students with Learning Disabilities* is also available.

The Need to Be Strategic Learners

Notwithstanding the difficulties that students with learning disabilities often experience with learning, they have the same need as their peers without disabilities to acquire the knowledge, skills, and strategies—both academic and nonacademic—that are necessary for functioning independently on a day-to-day basis in our society. Perhaps one of the most important skills they need to learn is *how* to learn. Knowing that certain techniques and strategies can be used to assist learning, knowing which techniques are useful in which kinds of learning situations, and knowing how to use the techniques are powerful tools that can enable students to become strategic, effective, and lifelong learners.

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Surprisingly, many learners know little about the learning process, their own strengths and weaknesses in a learning situation, and what strategies and techniques they naturally tend to use when learning something new. Yet, we all *do* use various methods and strategies to help us learn and remember new information or skills. For example, when encountering a new word while reading, some of us may try to guess its meaning from the context of the passage and be satisfied with an approximate idea of what it means, while others may look the word up in the dictionary or ask someone nearby what it means. Still others may go a step further and write the new word down or try to use the word in a sentence before the day is through. Some of these methods are more effective than others for learning and remembering new information, and some of us are more conscious of our own learning processes than others.

Because of the nature of their learning difficulties, students with learning disabilities need to become *strategic* learners, not just haphazardly using whatever learning strategies or techniques they have developed on their own, but becoming consciously aware of what strategies might be useful in a given learning situation and capable of using those strategies effectively. Teachers can be enormously helpful in this regard. They can introduce students to specific strategies and demonstrate when and how the strategies are used. Students can then see how a person thinks or what a person does when using the strategies. Teachers can provide opportunities for students to discuss, reflect upon, and practice the strategies with classroom materials and authentic tasks. By giving feedback, teachers help students refine their use of strategies and learn to monitor their own usage. Teachers may then gradually fade reminders and guidance so that students begin to assume responsibility for strategic learning.

What, Exactly, Are Learning Strategies?

Learning strategies are "techniques, principles, or rules that facilitate the acquisition, manipulation, integration, storage, and retrieval of information across situations and settings" (Alley & Deshler, 1979, p. 13). Strategies are efficient, effective, and organized steps or procedures used when learning, remembering, or performing.

"By equipping (students) with a repertoire of strategies for learning... teachers can provide (them) with the tools for a lifetime of successful learning."

More simply put, learning strategies are the tools and techniques we use to help ourselves understand and learn new material or skills; integrate this new information with what we already know in a way that makes sense; and recall the information or skill later, even in a different situation or place. When we are trying to learn or do a task, our strategies include what we *think* about (the cognitive aspect of the strategy) and what we *physically do* (the behavioral or overt action we take).

Strategies can be simple or complex, unconsciously applied or used with great awareness and deliberation. Simple learning strategies that many of us have used, particularly in school settings, include: notetaking, making a chart, asking the teacher questions, asking ourselves questions, re-reading when something does not make sense, looking at the reading questions before beginning reading, checking our work, making an outline before beginning to write, asking a friend to look over our composition, rehearsing a presentation aloud, making up a goofy rhyme to remember someone's name, using resource books, drawing a picture that uses every new vocabulary word we have to learn, or mapping in sequence the events of a story. Complex strategies tend actually to be a set of several different strategies that are used in tandem (and recursively) to accomplish a complex learning task such as writing a composition or reading a passage and answering questions. For example, a complex set of strategies for writing a composition might involve three recursive stages: planning, writing, and revising. Each of these stages can involve using many different strategies. When planning, for instance, we might think hard about the audience that will be reading what we've written (e.g., what do they need or want to know, or how can we best capture and hold their attention?), write an outline, and identify points where we need to gather more information in order to write effectively. When actually writing, we might focus on stating our main ideas well, supporting them with appropriate details, and summarizing our main points in the conclusion. Revising may have several mini-stages: looking back while writing to make sure we're following our outline (or deciding to abandon parts of the outline), laying aside the composition for a day, then re-reading it with a fresh eye. We might also check to make sure we've used correct punctuation and grammar, consult a dictionary or other resource guide when we're uncertain, and ask someone else to read what we've

Example of a Strategy Intervention

DEFENDS is the acronym for a strategic approach that helps secondary students write a composition in which they must take a position and defend it (Ellis, 1994). Each letter stands for a strategic step, as follows:

D ecide on audience, goals, and position
E stimate main ideas and details
F igure best order of main ideas and details
E xpress the position in the opening
N ote each main idea and supporting points
D rive home the message in the last sentence
S earch for errors and correct

written and give us feedback. We also move back and forth between these three stages—thinking and planning, writing for a while, re-reading to see how we're doing, thinking of how to fix mistakes or add new information, writing again—and on until we're finished.

The research literature abounds with descriptions of these strategy sets, often called strategy interventions, which are intended to make learners highly aware of what they doing, thus making their approach to completing specific tasks more purposeful, systematic, and, according to the research findings, more effective. The writing intervention called DEFENDS is an example of such a strategy set (see the box above). The name is actually an acronym; each letter stands for one of the steps in the strategy. Remembering the acronym helps students remember the steps they are to use when writing. Other interventions are described in this *News Digest*; additional ones are listed in the separate *Bibliography: Learning Strategies for Students with Learning Disabilities*.

Strategies can also be categorized in many different ways. Distinctions have been made, for instance, between cognitive and metacognitive strategies. *Cognitive strategies* help a person process and manipulate information—examples include taking notes, asking questions, or filling out a chart. Cognitive strategies tend to be very task-specific, meaning that certain cognitive strategies are useful when learning or performing certain tasks.

Metacognitive strategies are more executive in nature. They are the strategies that a student uses when planning, monitoring, and evaluating learning or strategy performance. For this reason, they are often referred to as self-regulatory strategies.

The use of metacognitive strategies indicates that the student is aware of learning as a process and of what will facilitate learning. Taking the time to plan before writing, for example, shows that the student knows what is involved in writing a good composition. Similarly, he or she might monitor comprehension while reading and take action when something does not make sense—for example, look back in the text for clarification or consciously hold the question in mind while continuing to read. Evaluating one's work, learning, or even strategy use is also highly metacognitive in nature, because it shows that a learner is aware of and thinking about how learning takes place.

Metacognitive strategies are at the core of self-regulated learning, which, in turn, is at the core of successful and lifelong learning. Self-regulation involves such strategies as goal-setting, self-instruction, self-monitoring, and self-reinforcement (Graham, Harris, & Reid, 1992). It's easy to see why self-regulated learners tend to achieve academically. They set goals for learning, talk to themselves in positive ways about learning and use self-instruction to guide themselves through a learning problem, keep track of (or monitor) their comprehension or progress, and reward themselves for success. Just as students can be helped to develop their use of cognitive, task-specific strategies, so can they be helped to use self-regulatory, metacognitive ones as well. In fact, the most effective strategy interventions combine the use of cognitive and metacognitive strategies.

Strategies have also been categorized by their purpose or function for the learner (Lenz, Ellis, & Scanlon, 1996). Is a strategy being used to help the student initially learn new information or skills? Such strategies are *acquisition strategies*. Is a strategy being used to help the student manipulate or transform information so that it can be effectively placed in memory? These types of strategies are *storage strategies*. Is a strategy being used to help the learner recall or show what he or she has learned? Such strategies are *demonstration and expression of knowledge strategies*.

What Strategies Might We Help Students Learn? Examples from the Reading Field

Decades of research into reading has resulted in a substantial knowledge base about how we learn to read, what effective readers do, what not-so-effective readers do and don't do, and how good reading skills might be fostered or poor reading skills remediated. Much of this knowledge base has been put to use in the form of strategy instruction—helping beginning readers, and those whose skills need remediating, develop the strategies the good reader uses. Good readers, for

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example, successfully construct understanding and meaning through interacting with the text using learning strategies, including thinking about what they already know on the topic, being aware when they are not understanding something in the text, and taking some sort of corrective action to clear up the difficulty (Pressley, Brown, El-Dinary, & Afflerbach, 1995). They also paraphrase or summarize as they go along, and they ask questions of themselves or others to maximize their comprehension. Studies have shown that children with learning disabilities and other low-achievers can master the learning strategies that improve reading comprehension skills (e.g., Deshler, Shumaker, Alley, Clark, & Warner, 1981; Idol, 1987; Palincsar & Brown, 1987; Schunk & Rice, 1989; Wong & Jones, 1982). Techniques that help students learn to ask questions and to paraphrase and summarize what they are reading have been shown to help them develop higher level reading comprehension skills. For students with learning problems, learning to use questioning strategies is especially important, since these students do not often spontaneously self-question or monitor their own reading comprehension (Bos & Filip, 1984).

This section looks briefly at some of the strategies that researchers and teachers have focused their attention upon, with the purpose of illustrating concretely what strategies might be helpful to students, particularly those with learning disabilities.

Questioning and Paraphrasing. Several strategic approaches have been designed to foster student interaction with the text being read. Reciprocal Teaching is one such approach (Brown & Palincsar, 1988). In Reciprocal Teaching, students interact deeply with the text through the strategies of questioning, summarizing, clarifying, and predicting. Organized in the form of a discussion, the approach involves one leader (students and teacher take turns being the leader) who, after a segment of the text is read, frames a *question* to which the group reponds. Participants can then share their own questions. The leader then *summarizes* the gist of the text. Participants comment or elaborate upon that summary. At any point in the discussion, either the leader or participants may identify aspects of the text or discussion that need to be clarified, and the group joins together to *clarify* the confusion. Finally, the leader indicates it's time to move on when he or she makes or solicits *predictions* about what might come up next in the text.

Paraphrasing, self-questioning, and finding the main idea are the strategies used in an approach developed and researched by Deshler, Schumaker, Alley, Clark, and Warner (1981). Students divide reading passages into smaller parts such as sections, subsections, or paragraphs. After reading a segment, students are cued to use a self-questioning strategy to identify main ideas and details. The strategy requires students to maintain a high level of attention to reading tasks, because they must alternate their use of questioning and paraphrasing after reading each section, subsection, or paragraph.

Questioning to Find the Main Idea. Wong and Jones (1982) developed a self-questioning strategy focused primarily on identifying and questioning the main idea or summary of a paragraph. They first taught junior high students with learning disabilities the concept of a main idea. A self-questioning strategy was then explained. Students then practiced the self-questioning strategy, with cue card assistance, on individual paragraphs. Following the practice, students were provided with immediate feedback. Eventually, following successful comprehension of these short paragraphs, students were presented with more lengthy passages as the cue card use was removed. Continuing to give corrective feedback, Wong and Jones (1982) finished each lesson with a discussion of students' progress and of strategy usefulness. Their results indicated that students with learning disabilities who were trained in a self-questioning strategy performed significantly higher (i.e., demonstrated greater comprehension of what was read) than untrained students.

Story-mapping. Idol (1987) used a story-mapping strategy to help students read a story, generate a map of its events and ideas, and then answer questions. In order to fill in the map, students had to identify the setting, characters, time and place of the story, the problem, the goal, the action that took place, and the outcome. Idol modeled for students how to fill in the map, then gave them extensive opportunities to practice the mapping technique for themselves and receive corrective feedback. She stated that if comprehension instruction provides a framework for understanding, conceptualizing, and remembering important story events, students will improve their comprehension of necessary information. Idol further recognized that comprehension improves only through direct teacher instruction on the use of the strategy, high expectation of strategy use,

"The most effective strategy interventions combine the use of cognitive and metacognitive strategies."

and a move toward students independently using the strategy.

This is just a sampling of the strategies that can be used by students to improve their reading comprehension technique. Many other strategies can be used in reading, and there are also many strategies designed for math, writing, and other academic and nonacademic areas (see NICHCY's *Bibliography: Learning Strategies for Students with Learning Disabilities*).

> *"Teaching methods need to provide students with the opportunity to observe, engage in, discuss and reflect upon, practice, and personalize strategies that can used with classroom tasks now and in the future..."*

The Research Base for Learning Strategies

As our knowledge has grown regarding the learning strategies that help us learn new information and perform various tasks, so has our knowledge regarding how to *teach* those strategies to students. In the last 20 years, a sizeable research base has developed that demonstrates the usefulness of directly teaching students how to use strategies to acquire skills and information and how to apply those strategies, skills, and information in other settings and with other materials (known as generalization). Unfortunately, a lengthy discussion of the research is beyond the scope of this *News Digest*; readers can refer to the stand-alone *Bibliography: Learning Strategies for Students with Learning Disabilities* for more information on how the learning strategy field has evolved. What is presented below is an overview of the conclusions that many researchers have drawn regarding learning strategy instruction.

Researchers at the University of Kansas have been deeply involved in researching learning strategies since the 1970s and have done much to define and articulate the benefits of strategy instruction in general and for individuals with learning disabilities in particular. Chief among the benefits is the fact that instruction in learning strategies helps students with learning disabilities approach and complete tasks successfully and provides them with techniques that promote independence in acquiring and performing academic skills (Ellis, Deshler, Lenz, Schumaker, & Clark, 1991).

The work at the University of Kansas has also resulted in one of the most well researched and well articulated models for teaching students to use learning strategies. This model has been known for years as the Strategies Intervention Model, or SIM, and was recently renamed the Strategies Integration Model. The SIM is designed as a series of steps that a teacher can use to effectively teach students to use any number of strategies or strategic approaches. (The model is described more fully on the next pages.) The SIM is not the only model available to guide how teachers provide students with strategy instruction; not surprisingly, researchers around the country tend to advocate similar methods, drawing from what is known about effective teaching methodology and about learning.

In a nutshell, teaching methods need to provide students with the opportunity to observe, engage in, discuss and reflect upon, practice, and personalize strategies that can be used with classroom and authentic tasks now and in the future (Rosenshine & Stevens, 1986). In using these teaching methods, teachers promote student independence in use of the strategies. Research makes it clear, however, that if students are to use learning strategies and generalize their strategic knowledge to other academic and nonacademic situations, teachers must understand both the strategies that provide students with the necessary learning tools and the methods that can be used to effectively teach those learning strategies to students.

Effective Teaching Methods

Just as there are effective approaches to learning, there are effective approaches to teaching. A great deal of research has been conducted into the nature of effective teaching, and much has been learned. Educational researchers (e.g., Englert, 1984; Nowacek, McKinney & Hallahan, 1990; Rosenshine & Stevens, 1986; Sindelar, Espin, Smith, and Harriman, 1990) have concluded, for example, that a systematic approach to providing instruction greatly improves student achievement. These researchers also state that teachers can learn the specific components of an effective, systematic approach to providing instruction and can modify and thereby enhance their teaching behavior. Using such a systematic approach with whatever is being taught can only help to further improve educational opportunities for all students, especially those who have learning disabilities.

Rosenshine and Stevens (1986) have identified common teaching practices of successful teachers, such as teaching in small steps, practicing after each step, guiding students during initial practice, and providing

all students with opportunities for success. Englert (1984) pointed out that successful teachers use lesson strategies to provide students with both direct instruction and the opportunity for practice. Lesson strategies include: communicating the rules and expectations of the lesson, stating instructional objectives and linking them to previous lessons, providing numerous examples, prompting student responses, and providing drill and further practice immediately following incorrect responses. Sindelar, Espin, Smith, and Harriman (1990) add that the more time an actively engaged educator spends in the instructional process, the more positive student behavior and achievement will be. Sindelar et al. (1990) suggest that effective teachers limit seatwork activities, provide ample opportunities for student overlearning through teacher questioning, and allow time to socially interact with students. They conclude that encouraging higher levels of student participation, providing effective classroom transitions (i.e., concluding one activity and moving on to another), and bringing lessons to a close by providing assignments for further practice are consistent with teacher-directed learning.

Nowacek, McKinney, and Hallahan (1990) indicate that teacher-directed, rather than student-directed, activities provide for an effective educational experience that is more likely to improve student achievement. Higher levels of student achievement occur because teachers, using a systematic approach, are more organized, have clearer expectations, maintain student attention, and provide immediate, corrective, and constructive feedback. Because their instruction is highly structured, these teachers provide a positive environment in which to learn.

Using a systematic approach to teaching does not suggest that teacher and student creativity is not a vital part of the process. It merely lays out an organizational framework that provides a means for enhanced, successful, and efficient learning.

Teaching Students to Use Learning Strategies

As with the basic tenets of effective teaching, much has been learned through research regarding effective learning strategy instruction. As mentioned earlier, a well articulated strategies instructional approach known as the Strategies Integration Model (SIM) has emerged from the research conducted at the University of Kansas. Based on cognitive behavior modification, the SIM is one of the field's most comprehensive models for providing strategy instruction. It can be used to teach virtually any strategic intervention to students.

First, of course, the teacher must select a strategy —most likely, a set of strategies — to teach to students. The decision of what strategy to teach, however, should not be arbitrary. Rather, the strategy should be clearly linked to (i.e., useful in completing) the tasks that students need to perform and where they need to perform them. When the strategy instruction is matched to student need, students tend to be more motivated to learn and use the strategy. (See NICHCY's *Bibliography* for articles that describe the wide range of strategy approaches being taught. See also the section entitled "What Strategies Might We Help Students Learn?", where several overviews of strategy approaches used in reading are given.)

Once the teacher has decided upon what strategy or approach to teach, he or she may find the steps of the SIM particularly useful for guiding how the actual instruction should proceed. A fairly detailed description of suggested steps is given below.

1. Pretest Students and Get Them Interested in Learning the Strategy Although the teacher may not wish to call this step "testing," it is nonetheless important to know how much the students already know about using the strategy and to secure their commitment to learning the strategy from top to bottom. As Lenz, Ellis, and Scanlon (1996) remark, "Short of standing over students with a gun, you cannot force them to be strategic against their will" (p. 85).

Letting students know that gains in learning can occur when the strategy is used effectively is one of the keys to motivating them. Studies have shown that it is important to tell students directly that they are going to learn a strategy that can help them in their reading, writing, or whatever skill is being addressed through the strategy. They also need to know that their effort and persistence in learning and in using the strategy can bring them many learning benefits. In a study by Shunk and Rice (1989), for example, students were put into three groups and taught the strategy of finding the main idea of a reading passage. The groups, however, were given different *goals* for their work. One group was told that the goal of the activity was to learn the strategy, which would help them answer several reading questions. Another group was told that the goal was to answer several reading questions; the third group was simply told to "do their best." Results indicated that students whose learning goal was to learn the strategy performed the best when posttested. Understanding, knowing, and applying a strategy that assisted comprehension, Shunk and Rice (1989) reported, gave students a sense of control over their learning outcomes and, therefore, encouraged students to use the strategy. Use of the strategy also fostered a sense of task involvement among students. These

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results indicate the importance of overtly teaching students both the strategy and the *power* of the strategy—i.e., making sure they understand that the strategy can help them learn, and *how* it can help.

The pretest can be instrumental in helping students see the need to learn the strategy. To this end, it is critical that the teacher pretest students using materials and tasks that are similar to the materials and tasks that the students actually encounter in their classes. The strategy should also be useful when working with those materials and tasks—in other words, students will find it easier to work with those materials or perform those tasks if they apply the strategy.

The pretest should be primarily focused on completing the task (e.g., reading a passage and answering questions). Following the pretest, the class should discuss results. How did students do? Were they able to perform the task successfully? What types of errors did they make? What did they do, or think about, to help themselves while taking the pretest? What difficulties did they have, and how did they address those difficulties? If students did not perform particularly well, the teacher then indicates that he or she knows of a strategy or technique that will help students perform that task more successfully in the future.

Obtaining a commitment from students to learn the strategy, according to the SIM model, can involve any number of approaches, including discussing the value of the strategy, the likelihood that success will not be immediate upon learning the strategy but will come if the student is willing to persevere and practice the strategy, and the teacher's own commitment to helping the students learn the strategy (Lenz, Ellis, & Scanlon, 1996). (With elementary school students, student-teacher collaboration in use of the strategy is especially important; teachers need to discuss and practice strategies with these young students frequently.) Commitments can be verbal or in writing, but the idea here is to get the students involved and to make them aware that their participation in learning and using the strategy is vital to their eventual success.

2. Describe the Strategy. In this stage, teachers "present the strategy, give examples, and have students discuss various ways the strategy can be used" (Day & Elksnin, 1994, p. 265). A clear definition of the strategy must be given, as well as some of the benefits to learning the strategy. The teacher should also identify real assignments in specific classes where students can apply the strategy and ask students if they can think of other work where the strategy might be useful. Students should also be told the various stages involved in learning the strategy, so they know what to expect.

Once this type of overview is provided and the teacher feels that students are ready to delve more deeply into hearing about and using the strategy, instruction must become more specific. Each separate step of the strategy must be described in detail. It is important that the strategy is presented in such a way that students can easily remember its steps. Many strategies have been given an acronym to help students remember the various steps involved. (An example is listed in the box below; another, DEFENDS, was given earlier in this *News Digest*.) Students may also benefit from having a poster or chart about the strategy and its steps displayed in plain view.

During the description stage, the class may also discuss how this new approach to a specific task differs from what students are currently using. The stage should conclude with a review of what has been said.

3. Model the Strategy. Modeling the strategy for students is an essential component of strategy instruction. In this stage, teachers overtly use the strategy to help them perform a relevant classroom or authentic task, talking aloud as they work so that students can observe how a person thinks and what a person does while using the strategy, including: deciding which strategy to use to perform the task at hand, working through the task using that strategy, monitoring performance (i.e., is the strategy being applied correctly, and is it helping the learner complete the work well?), revising one's strategic approach, and making positive self-statements. An example of such a think aloud is provided in the box at the right.

The self-talk that the teacher provides as a model can become a powerful guide for students as responsibility for using the strategy transfers to them. In fact, Lenz, Ellis, and Scanlon (1996) suggest that teachers model the strategy intervention more than once and involve students in these subsequent modelings by asking ques-

An Example of an Acronym Designed to Help Students Remember the Steps in Using a Strategy

COPS is the acronym for a strategic approach that helps students detect and correct common writing errors. Each letter stands for an aspect of writing that students need to check for accuracy (Shannon & Polloway, 1993).

C Capitalization of appropriate letters
O Overall appearance of paper
P Punctuation used correctly
S Spelling accuracy

tions such as "What do I do in this step?" Teachers can prompt this type of student involvement by asking "Now what's next? How do we do that step? What questions should you be asking yourself?" (p. 109). Student responses will help the teacher determine how well the students understand when and where they might use the strategy intervention, as well as the steps involved in the intervention.

4. Practice the Strategy. Repeated opportunities to practice the strategy are important as well. The more students and teachers collaborate to use the strategy, the more internalized the strategy will become in students' strategic repertoire. Initial practice may be largely teacher-directed, with teachers continuing to model appropriate ways of thinking about the task at hand and deciding (with increasing student direction) which strategy or action is needed to work through whatever problems arise in completing the task.

Students may also be called upon to "think aloud" as they work through the practice tasks, explaining the problems they are having, decisions they are making, or physical actions they are taking, and what types of thoughts are occurring to them as they attempt to solve the problems, make the decisions, or take the physical actions. These student think alouds should increasingly show the strategy being used to help them complete the task successfully. While these think alouds may initially be part of teacher-directed instruction, students may benefit greatly from practicing as well in small groups, where they listen to each other's think alouds and help each other understand the task, why the strategy might be useful in completing the task, and how to apply the strategy to the task. Practice opportunities should eventually become self-mediated, where students work

How Teachers Might Model a Strategy by Thinking Aloud

One strategy that is vital when reading, particularly for students with learning disabilities, is *comprehension monitoring*. Comprehension monitoring "is the active awareness of whether one is understanding or remembering text being processed" (Pressley, Brown, El-Dinary, & Afflerbach, 1995, p. 218).

After explaining to students that good readers constantly monitor how well they are understanding what they read, the teacher might "show" students an example of how we think when we monitor. She puts up a sample text entitled "Grizzly Bears," reads it aloud, and thinks aloud as she's reading. Note that the think aloud below illustrates some of the corrective actions (e.g., asking questions, looking back in the text, thinking about what we already know, reading on) good readers might take to clear up any confusions.

The text the teacher reads: "Grizzly bears are found in western Canada and in Alaska, living in forests on mountain sides. They have shaggy fur, humped shoulders, sharp teeth and long, sharp claws...Grizzlies usually live alone. Each bear has its own area of land, called a "home range." It leaves scents on the bark of trees all the way around its home range to let other bears know where it lives." [Wood, J. (1989). *My first book of animals* (p. 34). Boston, MA: Little, Brown.]

The teacher's think aloud might be as follows:

Let's see. This is about grizzly bears, I can tell that from the title. I know a little bit about grizzly bears — they're big and have sharp claws and teeth, and sometimes they come into people's campsites and try to get the food. I guess they're not all Gentle Ben... okay, "...found in western Canada and in Alaska," places it's cold, yeah, that makes sense because they hibernate in winter, I remember that now..."living in forests on mountain sides. They have shaggy fur..." I guess that's good, cos they live where it's cold.

"...humped shoulders..." Humped shoulders? What do they mean by that? Oh, maybe when they're down on all fours, yeah, their backs are kind of like a hump then, okay, I get it "...and have sharp claws and teeth..." see! I knew that!

"Grizzlies usually live alone..." I wonder why that is. Don't they like one another? Maybe they don't want to share the food they find, or maybe they fight over territory...Let me look back and see if I missed something...[re-reads] no, I still don't have a clue. Maybe they'll tell me in a bit why bears don't live together in little groups, let's see.

"Each bear has its own area of land...[reads to end], no, no answer, at least not real clear. I can see they probably do defend their territory, though, if they mark the trees with their scent. They must be like dogs then, dogs do that, mark things with their scent, to warn other dogs off. Sort of like a fence around your yard! I wonder how they leave the scent, though —maybe they go on the tree or rub up against it, against the bark. I also wonder how big an area a bear gets. As big as he wants, I guess, with all those claws and teeth!

independently to complete tasks while using the strategy.

In the beginning, students should practice using the strategy with materials that are at or slightly below their comfort level, so they do not become frustrated by overly difficult content. Using materials that are well matched to the strategy is also important, because then students can readily see the strategy's usefulness. As time goes by and students become more proficient in using the strategy, materials that are more difficult should be used.

5. Provide Feedback. The feedback that teachers give students on their strategy use is a critical component in helping students learn how to use a strategy effectively and how to change what they are doing when a particular approach is not working. Much of the feedback can be offered as students become involved in thinking aloud about the task and about strategy use, in the modelling and practice steps described above. It is also important to provide opportunities for students to reflect upon their approach to and completion of the task. What aspects of the task did they complete well? What aspects were hard? Did any problems arise, and what did they do to solve the problems? What might they do differently the next time they have to complete a similar task?

6. Promote Generalization. It is important for students to be able to apply the strategy in novel situations and with novel tasks. Surprisingly, many students will not recognize that the strategy they have been learning and practicing may be ideal for helping them to complete a learning task in a different classroom or learning situation; this is particularly true of students with learning disabilities (Borkowski, Estrada, Milstead & Hale, 1989). Thus, mere exposure to strategy training appears insufficient for both strategy learning and strategy utilization (Wood, Rosenburg,& Carran, 1993). Consistent, guided practice at generalizing strategies to various settings and tasks is, therefore, vital for students with learning disabilities (Pressley, Symons, Snyder & Cariglia-Bull, 1989), as are repeated reminders that strategies can be used in new situations (Borkowski, Estrada, Milstead & Hale, 1989).

Therefore, teachers need to discuss with students what generalization is and how and when students might use the strategy in other settings. An important part of this discussion will be looking at the actual work that students have in other classes and discussing with students how the strategy might be useful in completing that work. Being specific—actually going through the steps of the strategy with that work—is highly beneficial. Students can also be called upon to generate their own lists of instances where they might apply the strategy in other classes. (An example of a student-generated list of opportunities to use the strategy COPS is given in the box on the next page.) Additionally, teachers may wish to coordinate between themselves to promote student use of strategies across settings, so that the strategies being taught in one classroom are mentioned and supported by other teachers as well. All of these approaches will promote student generalization of the strategy.

Other Approaches to Strategy Instruction

The steps given above have been drawn primarily from research conducted at the University of Kansas and represent one strong approach to teaching the wide range of strategies that learners can use to tackle challenging learning situations. Other approaches to strategy instruction exist as well (see NICHCY's *Bibliography: Learning Strategies for Students with Learning Disabilities*), with most recommending many of the steps articulated in the SIM. Much effort has gone into defining, testing, and refining their

The Importance of Positive Self-Statements

Teachers may find that it's important to address the negative feelings that many students with learning disabilities have about learning and about themselves. Often, these students believe that they cannot learn, that the work is simply too difficult, or that any success they might achieve is due to luck. They may not readily believe they can achieve success in learning through their own effort and strategic activities and thoughts, and so they may not persist in using strategies.

Just as teachers can help students develop strategic approaches to learning, teachers can help students learn to attribute success in learning to their own effort and use of strategies. Modeling positive self-statements, and encouraging students to use such self-talk, are essential.

Examples of positive self-statements that attribute success to effort and not to luck include: "I can probably do this problem because I've done similar ones successfully." "I'm usually successful when I work carefully and use the learning strategy correctly." "If I make a mistake, I can probably find it and correct it." (Corral & Antia, 1997, p. 43) Changing students' perceptions about themselves and about the connection between effort and success can be a vital element in their willingness to keep trying in the face of challenge, using learning strategies as a valuable tool.

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components, and in validating their effectiveness in promoting student achievement.

While the SIM and other strategy instruction models present educators with an overall structure for *teaching* students about learning and about learning strategies and techniques, the research literature also abounds with descriptions of specific strategies that students can use to enhance their reading, writing, and math skills. There are also many descriptions of strategies designed for use in specific academic (e.g., science) and non-academic (e.g., social skills) areas. Some strategy interventions are designed for use at the elementary level, while others are appropriate for secondary students. (Many of these are listed in the stand-alone bibliography that is the companion to this *News Digest*.) While much is known about strategy instruction, new instruction and instructional methodology continues to unfold, as does our understanding of both strategies and strategy instruction. Therefore, strategy techniques and instruction should not be looked upon as a cure-all when working with students who have learning disabilities but as another possible approach to meeting learners' needs.

Conclusion

Learning strategy instruction appears to hold great educational potential, especially for students who have learning disabilities. This is because strategy training emphasizes helping students learn how to *learn* and how to use strategies found to be effective in promoting successful performance of academic, social, or job-related tasks. Students need these skills not only to cope with immediate academic demands but also to address similar tasks in different settings under different conditions throughout life. Strategies are, thus, skills that empower. They are resources for an individual to use, especially when faced with new learning situations.

Good strategy instruction makes students aware of the purposes of strategies, how they work, why they work, when they work, and where they can be used. To accomplish this, teachers need to talk about strategies explicitly, describe and name them, model how they are used by thinking aloud while performing tasks relevant to students, provide students with multiple opportunities to use the strategies with a variety of materials, and provide feedback and guidance to help students refine and internalize strategy use. Ultimately, responsibility for strategy use needs to shift from teacher to students, so that students can become independent learners with the cognitive flexibility necessary to address the many learning challenges they will encounter in their lives.

Of course, no single technique or intervention can be expected to address the complex nature of learning or the varied needs of all learners. When working with students with learning disabilities, teachers will find it highly beneficial to have a variety of interventions and techniques with which to foster student success. Strategies are one such technique—and a powerful one at that! When students are given extensive and ongoing practice in using learning strategies within the context of day-to-day school instruction, they become better equipped to face current and future tasks. Learning *how* to learn provides them with the ability to be independent lifelong learners, which is one of the ultimate goals of education. When students learn, they grow and change intellectually. They acquire more than knowledge. They enhance their sense of competence and their ability to achieve.

Student-Generated List of Opportunities to Use COPS

Love letters
Homework assignments
Spelling practice
Job applications
English papers
Written math problems
Health questions
History exam questions
Friendly letters
Written instructions

(Shannon & Polloway, 1993, p. 161)

About the Author...

Neil Sturomski has worked for over 20 years in the learning disabilities field. He has taught both children and adults with learning disabilities, first as a teacher in grades K-12 and then as the Director of the Night School program of the Lab School of Washington. Most recently, Mr. Sturomski has served as the Director of the National Adult Literacy and Learning Disabilities Center, in Washington, DC. Mr. Sturomski is currently President and CEO of Sturomski and Associates and is deeply involved in training teachers to help individuals with learning disabilities learn how to use learning strategies.

NICHCY would like to express its deep appreciation to Neil for this article—and for his incredible patience!

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Phonological Awareness

by

William Ellis

Reading is a complex activity. It sends our brains into a frenzy of electrical impulses that zig and zag through matter in ways we still do not totally understand. It organizes sights and sounds in designs that ultimately connect us to the broad vistas of life's many landscapes. Reading gives us the opportunity to appreciate those landscapes in all their variety. It is remarkable that, whatever approach, method, or ideology is used to teach reading, most students become proficient at it. For many students, successful reading is assimilated into their experience quickly and with seeming smoothness. Fortunate, the students for whom reading comes easily!

> *"Phonological awareness has the potential to unravel the mysteries of reading to countless thousands of individuals..."*

For perhaps as many as 20% of students, however, reading is not an automatic skill. Patterns of understanding have to be systematically instilled so that the reader has the opportunity to crack the alphabetic code. More and more, what we have learned is that connecting these alphabetic symbols to specific sounds in order to create meaningful words and phrases is a significant aspect of reading. There is considerable longitudinal research to support that we all employ this skill every time we read. Without this connection between the basic unit of sound and the alphabetic symbol, reading does not occur for any of us (Liberman & Liberman, 1990).

These basic units of sounds contained within each word are called *phonemes*. Research has shown that understanding of these phonemic units, more than any other factor, is a critical part of successful reading. Phonemic awareness involves analyzing and combining the smallest units of discernable sound (phonemes) in a variety of ways, in order to connect the symbols (letters) which represent them, to specific meanings. The word "bat," for example, has three phonemes. The phonic approach would involve helping the student discover the word produced when the /b/, /a/, and /t/ sounds are put together.

Throughout the history of the teaching of reading, there has been a great debate between those who advocate teaching reading through structured language approaches involving phonics, and those who suggest that it is sufficient to grasp the relation of a whole word to its meaning derived from some larger context (Chall, 1989). In the example used above, the word "bat" might be learned through its placement in a sentence such as, "We use a bat in baseball." For many years, the trend in school systems has been to use this method, called the "whole language" approach.

Unfortunately, in schools where the whole language approach is used to teach reading, simultaneous teaching of explicit phonics is not always considered useful or necessary. Whether the phonemic or the whole language approach is used, always we find that there is a block of children who still do not learn to read. This suggests that school systems have no systematic way for determining a satisfactory match between the way which an individual child learns to read and the teaching approaches used. In her book *Beginning to Read*, commentator Marilyn Adams (1990) suggests that the phonemic and whole language approaches do not have to be mutually exclusive but can complement each other's strengths to the betterment of all readers. Recently, it appears that there is a movement to follow her sage advice. Also, long-term research is being conducted through the National Institute of Child Health and Human Development (NICHD) grants to determine how to match different types of learners and effective teaching approaches. Several of these approaches directly reflect our knowledge of phonemic awareness.

The validity of the phonemic approach is supported by considerable empirical data spanning more than 20 years. Much of the research has been sponsored by NICHD through projects such as the Dyslexia Program Projects in the late 1970s and the Learning Disability Research Centers in the late 1980s. Working independently and on different projects, these centers have achieved convergent results that are extremely compelling (Moats & Lyon, 1993). In fact, the importance of phonological awareness in learning to read is one of the few aspects of reading supported by such substantial, long-term research. This research has demonstrated that a significant number of children (15 to 20%) do not learn to read successfully unless they receive direct instruction in phonological aware-

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ness. Therefore, it is imperative that, whatever approach is used to teach reading skills, the needs of this population must not be ignored.

We do not know precisely why acquisition of phonemic awareness is delayed in some students. We do know that certain kinds of language activities for the pre-academic child make a substantial difference. For example, rhyming games can have an important effect (Bradley & Bryant, 1985). Children who have difficulty with rhyming often seem to have difficulty learning to read. Therefore, utilizing rhyming games and songs with young children can assist in identifying those children who may have difficulty reading later, so that useful interventions can be made to strengthen their skills. Keith Stanovitch (1993) outlines several activities that enhance phonemic awareness:

- ✓ Phonemic deletion: What word would be left if the /k/ sound were taken away from cat?
- ✓ Word-to-word matching: Do pen and pipe begin with the same sound?
- ✓ Blending: What word would we have if we put these sounds together: /s/, /a/, /t/?
- ✓ Sound isolation: What is the first sound in rose?
- ✓ Phoneme segmentation: What sounds do you hear in the word hot?
- ✓ Phoneme counting: How many sounds do you hear in the word cake?
- ✓ Deleted phoneme: What sound do you hear in meet that is missing in eat?
- ✓ Odd word out: What word starts with a different sound: bag, nine, beach, bike?
- ✓ Sound-to-word matching: Is there a /k/ in bike?

Activities of this kind can be fun and interesting to all children. To those for whom increased phonemic awareness is essential, they are a godsend. Nevertheless, even if we were to achieve a perfect record of teaching phonemic awareness, there will still be a significant number of individuals who will have difficulty with reading and other language tasks. Researchers in the medical and educational fields are pursuing avenues for understanding the root causes of these problems. It is hoped that such understanding will bring about some additional ways of presenting reading, so that yet another subset of poor readers can be helped.

With phonological awareness, we have the opportunity to establish modes of teaching that are based on solid research. Annual data supplied by the U.S. Department of Education (1995) show that more than 50% of school-age youngsters being provided special education services have learning disabilities and that, of these, more than 80% manifest their difficulties in reading and language. It is clear that a major effort in teaching phonological awareness at the earliest possible opportunity will have a significant impact on reducing the number of individuals who will require special services.

A major impediment to implementing a phonemic approach is the poor level of phonemic awareness among teachers who teach reading and among teachers in general. This lack of awareness is reported in a major survey by Louisa Moats (1994), who found that teachers often were aware of their lack of knowledge and earnestly sought greater understanding, but they had received little training. Moats' findings suggest that shifting our approach to teaching reading means training teachers in phonological awareness. Teachers who do not understand the structural basis of language will have little success in teaching it or in perceiving the difficulties with language that some children have.

Anderson et al. (1985), in their seminal report *Becoming a Nation of Readers*, alerted the nation to the need for explicit phonic teaching. As early as 1985, they had observed a decline in reading scores among selected groups of children. The report, perhaps overshadowed by other more startling calls for school reform, never received the attention it merited. In the intervening years, little has changed, and test scores continue to decline. The nation has poured millions of tax dollars into research that supports phonological approaches, yet little has changed in the school systems. Emphasizing phonological awareness in teaching reading is an approach that appears to match the method to our body of knowledge. Phonological awareness has the potential to unravel the mysteries of reading to countless thousands of individuals, and to protect their well-being as well as that of the nation. The phonemic approach to reading is an area where we actually have well-documented tools. We need to use them.

About the Author...

As an educator and advocate, William Ellis contributed a great deal to the learning disabilities field. During his career, Mr. Ellis chaired numerous national symposia, edited several books, and published many articles on reading and learning. Prior to his death in 1995, he served as the Director of the National Center for Learning Disabilities and as Executive Editor of Their World, *an annual publication of NCLD. Most of all, he was a man of tremendous compassion.*

Bill wrote this article for NICHCY in the last months of his life. We at NICHCY are proud to offer this work to the field.

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NICHCY would like to express its gratitude to the authors of this *News Digest*, Neil Sturomski and Bill Ellis. We also would like to thank the individuals who lent their time and expertise to review this document in draft and who provided us with a wealth of suggestions and guidance: Dr. Karen R. Harris, Professor and Researcher, College of Education, University of Maryland; Dr. David Scanlon, Assistant Professor, Boston College, Chestnut Hill, MA; Jean Petersen, National Executive Director, Learning Disabilities Association of America, Pittsburgh, PA; Joelle LeBlanc, Teacher, Cathedral School, Washington, DC; Ann Roldan, Teacher, The Lab School, Washington, DC; and the National Center for Learning Disabilities, New York, New York.

NICHCY welcomes Dr. Peggy Cvach as our Project Officer at the Office of Special Education Programs, U.S. Department of Education.

Project Director . . . . . Suzanne Ripley
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